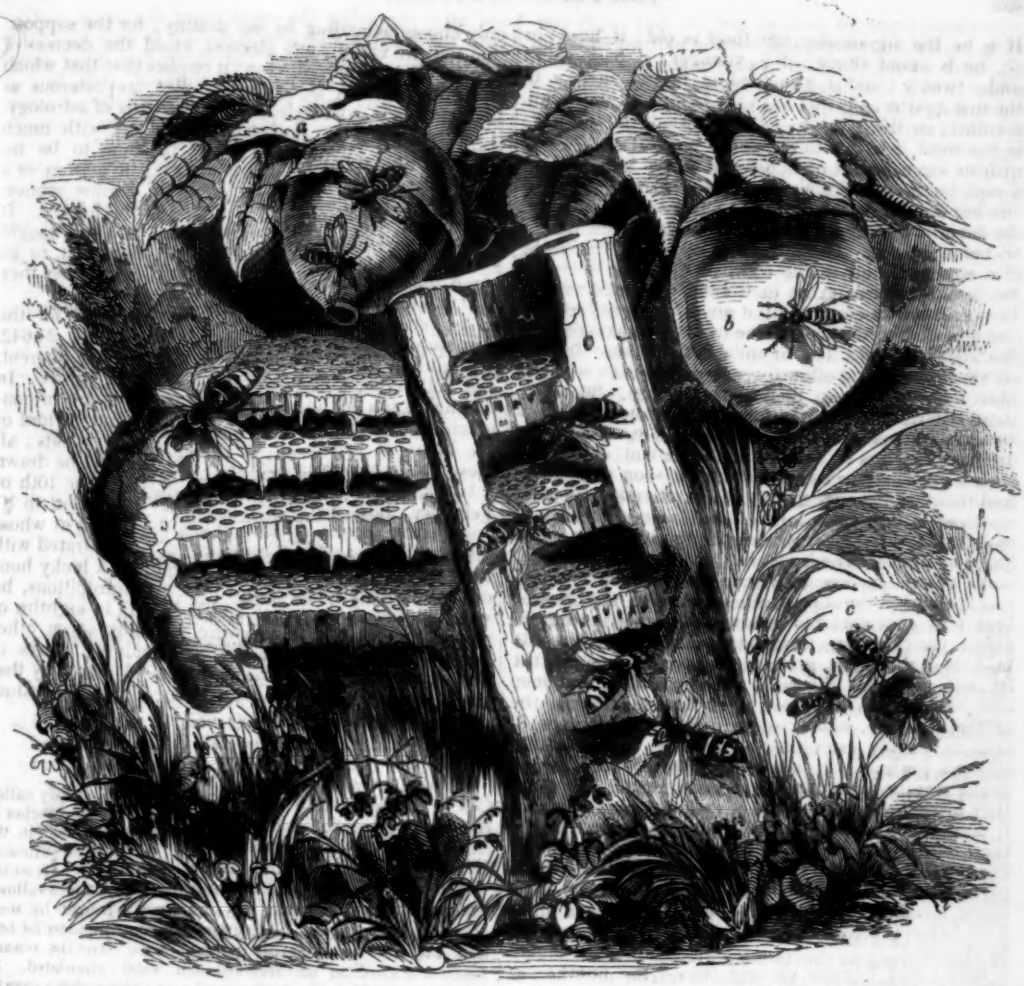

[Nests of Common Hornet: one of them in the hollow of a wooden post.—*a*, Vespa Britannica (Insect and Nest); *b*, Vespa holsatica (Insect and Nest); *c*, Vespa vulgaris.]

CURIOSITIES OF BRITISH NATURAL HISTORY.

Wasps and their Nests

Every one knows the Common Wasp (*Vespa vulgaris*), every one has observed its abundance at the latter part of summer and the beginning of autumn,—its fondness for sweet fruits, sugar, and flesh,—and its propensity to attack and devour weaker insects. Many perhaps of our readers have assisted in storming a wasp's nest, or vespiary, and have experienced the danger attendant upon the assault; but they may not clearly understand the structure of that insect-city, nor the habits and economy of its crowded population. It will be our endeavour to make these points as clear as possible. We may premise by saying, that in many respects there is great similarity between the operations of these insects and of the Humble-Bees detailed in a recent number. A vespiary during the season of bustle and activity contains the following inhabitants:—1, females of two sorts, a large variety, the founder of a future colony, and a smaller variety, producing, it is believed, only male eggs; 2, workers; 3, males; 4, eggs and young. But there is no honey, no store of food. All these busy creatures, however, are destined to perish when the severity of winter sets in; all, except a few of the larger females of the year, which become torpid, and thus survive the dreary months of frost and cold. Let us take one of these slumbering females and trace her operations.

We must suppose that before retiring to her dormitory she had paired with a mate. Spring approaches, and the warm beams of the sun give life to vegetation and call forth leaves and flowers. The birds are preparing their nests, the swallow has appeared, the note of the cuckoo resounds in the fields, and "the voice of the turtle is heard in our land." Revived by the genial temperature, the solitary foundress of an empire issues forth, and soon commences her labours. Her first object is to make or appropriate and enlarge a subterranean chamber. For this purpose she explores sunny banks and old deep thatches in quest of suitable location. She may perhaps meet with the deserted burrow of a shrew or field-mouse, and enlarge it according to her discretion; but generally, we think, as far as our own observations go, she makes her own cavern. This consists of a large chamber from one to two feet in diameter, to which a narrow winding en-

trance leads from the surface, and we may easily conceive, even if this retreat had been in part prepared for her, what a work of toil and patience she has to accomplish. But it is at last accomplished, yet her labour is not ended; it is well that her mandibles are strong and her limbs vigorous, for she has further service for them to perform. She has to construct her walled citadel, with its arrangement of floors and cells; not that she completes it, but she begins it, she forms a certain number of cells, perhaps several hundred, and in these she deposits her eggs, the eggs of workers, destined to be her assistants. These eggs are attached by means of a strong gluten to the walls of the cells, and are watched over with great care and apparent anxiety. They are soon hatched, and the grubs, or larvæ, are fed and attended to till they change to the pupa state; in this they remain a few days, and then come forth a crowd of obedient workers, ready within the course of twelve hours to assist their parent queen. They set about enlarging and perfecting the vespiary; they construct additional tiers of cells, in which the queen deposits the eggs of females and other workers; they are assiduous in their care of the newly hatched larvæ, feeding them and eagerly collecting nutriment for their sustenance. For this purpose they disperse themselves in different directions, or in a body visit some storehouse of sweets; hundreds may be seen in open sugar-casks before the door of a grocer's warehouse, many venture within the shop itself, some attack the hives of bees and endeavour to rob them of honey, others direct their course to gardens and orchards, and bushels of the ripest greengages have we seen spoiled by their ravages. Loaded with sweet food, but not, like the bee, with the nectar of flowers, they return to their charge, and, visiting cell after cell in succession, supply each restless craving larva with its allotted portion. It would appear that the larger grubs require more substantial nutriment. For these they bring home captured flies and bits of meat stolen from the butcher's stall, and with these dainties feed their expectant younglings. Thus are they ever busy, ever on the alert; for no sooner has one brood become perfected than another is in progress. Thus from being a solitary unassisted being, the queen mother finds herself, before the close of summer, surrounded by thousands.

Kirby and Spence observe that "the number of cells in a vespiary sometimes amounts to more than sixteen thousand, almost all of which contain either an egg, a grub, or a pupa. Each cell serves for three generations in the year, which, after making every allowance for failures and other casualties, will give a population of at least thirty thousand. Even at this time, when she has so numerous an army of coadjutors, the industry of this creature does not cease, but she continues to set an example of diligence to the rest of the community. If by accident, before the other females are hatched, the queen mother perishes, the neuters cease their labours, lose their instincts, and die. The number of females in a populous vespiary is considerable, amounting to several hundred. They emerge from the pupa about the end of August, at the same time with the males, and fly in September and October, when they pair; but of this large number of females, few survive the winter." We may add, that it is upon those few that the perpetuation of the race depends.

We have said that the workers assist materially in the care of the larvæ, and in the extension and reparation of the vespiary: they are in fact the active servants of the queen. Some of them are necessarily engaged in-doors, while others are employed abroad on foraging expeditions for food. But the wants of the in-door labourers are not neglected: the foragers return, and after supplying the appetites of the larvæ, distribute the surplus, which they appear to do with great impartiality. Disgorging the saccharine juice drop by drop, part is given to the workers, part to the females, and part to the males; and each honey-bearing worker is attended by several, each receiving its ration. Unlike the males of the bee, the males of the wasp are not idle: they do not, it is true, collect food or repair the vespiary, but they busy themselves in keeping it clear of extraneous substances, they remove all offensive matter, and carry out the bodies of such of the community as may chance to die in the place. They are, in short, labourers of an inferior class, but still indispensable for the general good. They exceed the workers in size, but are less than the large females.

So far all has gone on with order and in harmony; but October is closing, and the rigour of winter has set in; they have laid up no store of food, and numerous cells are occupied by larvæ. It would seem as if a sudden frenzy had seized the active tenants of the vespiary: their devoted attachment to the young is changed to apparent hatred; they drag the larvæ out of their cells, sting them, and so destroy them, scattering their lifeless bodies around the entrance of the vespiary. Is it in mercy to their young that they are thus instincted to act, thereby preventing the pangs of hunger and a lingering death? or has their disposition undergone a radical change? or rather, are they not impelled to it by that strange overstrained feeling of morbid anxiety for the young which leads the rabbit and some other animals to destroy and devour their offspring if disturbed at an early age in the nest? Be this as it may, thus it would appear are the larvæ sacrificed: but the death of their destroyers is at hand. After lingering a little while, they all perish; and the busy bustling vespiary, so lately the scene of industry and order, is silent and tenantless. We have said all perish; this is not quite the case: perhaps two or three of the more powerful and vigorous females, instead of sinking into death, pass into a state of numbness and lethargy, reviving on the return of spring. In very wet or very severe seasons the number of females which thus escape is less than it is in a mild winter; and it often happens, from the vespiary becoming deluged, that not one escapes the general fate. In some vespiaries, according to their situation and other circumstances, more females will survive than in others; but in none is the number considerable. Even in the spring, when the female is engaged with her first brood, heavy rains will sometimes flood the new and unfinished vespiary, and destroy the queen mother and her larva progeny. It is from these and similar causes most probably that the abundance of wasps varies in different years, their numbers being comparatively scanty one summer compared with what they are another summer.

We have hitherto said nothing of the structure and material of the vespiary itself. It is time that we turned our attention to it. The vespiary then is made of paper, or "papier-maché." Yes, the wasp is a paper-manufacturer, and, time immemorial, "ere Greece and Rome had writ their annals," did it prepare this invaluable material; so that the wit of man in this, as in other things, has been forestalled by instinct. But it may be asked, by what process and from what raw material is this paper made? It is made from the fibres of wood. The insects, by means of their strong mandibles, tear away and bite off filaments or minute fragments from half-decayed trees, from posts, rails, palings, and the like, which have been well weathered. Long had the material with which the wasp makes her vespiary puzzled scientific inquirers, and it was reserved for M. Réaumur to discover the secret. It was by chance

that he saw a female wasp alight on the sash of his window and begin with her mandibles to detach slender fibres from the wood, little more than a line in length, and gather them into a bundle with her feet, adding to it from other parts of the woodwork favourable from her purpose. He observed that before detaching each fibre she bruised it in her mouth, adding it to the rest. He examined her bundle—he imitated it, and by means of a pen-knife produced one similar;—the material of the vespiary was discovered. The observations of Réaumur have been confirmed again and again, and may be verified by any person who will take a little pains to satisfy himself. These filaments, thus collected, are carried home, and masticated into a sort of pulp by the addition of a viscid saliva, which blends the whole into a ductile mass, capable of being spread out, or moulded into the required form. The work, executed by a multitude of wasps, is conducted with the utmost order, and proceeds with great rapidity—each has its allotted station, and is ready with its ball of *papier-maché*.

We have stated that the wasp makes its vespiary in a chamber underground or in deep old thatch. The vespiary itself is of a roundish or oval figure; externally it presents a coat of tiling, or rather of thin overlapping pieces of greyish paper, like little flat oyster-shells; these cover a number of layers one above another (fifteen or sixteen), constituting the wall, within the hollow of which the plates of cells or combs are arranged. These in a finished vespiary are from twelve to sixteen in number, and are placed not vertically, as in the beehive, but horizontally, the cells being on the under side of each table, with the mouths downwards. These tables are not only fixed to the sides of the outer walls, but have their centre supported by suspension rods, like colonnades of pillars with the base and capital wider than the shaft. The top of each table forms a floor, where, amidst the suspension rods, the wasps can walk about, attending to the young in the cells above their heads, having a clear space of about half an inch from the cells to the platform. Two holes at the bottom of the nest, to each of which a covered way leads, are the doors (one of egress, one of entrance) of the vespiary, and orifices admit of access from one stage to the other. The whole structure is generally about three feet in circumference,—we have seen larger and smaller. In the building of this beautiful structure, the dome is first finished, and the first comb, or table with pendent cells, laid across; the dome is then brought lower down, and another plate added, and secured to the former by stout suspension rods. The first layer or two is the work of the solitary female, the workers in due time come to her assistance, and carry on the operations, which are not completed till the middle or close of autumn. Winter comes, and it then only serves as the dormitory of a few torpid females: these in the spring commence the whole over again, for the same structure is never used a second season.

The hornet (*Vespa Crabro*) builds essentially the same kind of structure as the wasp, but of coarser material; the colour of the papier-maché is generally of a yellowish brown. The hornet often builds in hollow logs or the holes of decayed trees, which they enlarge to suit the size of the vespiary. Their strong mandibles enable them to do this with ease, and even, as we learn from Réaumur, to bore a winding way to the nest through the solid and undecayed substance of the tree, carrying away the portions they gnaw off. It is not, however, always in the hollows of trees that the hornet rears its vespiary; it often places it in thatch, or under the tiles of old barns or outhouses, or in dark obscure nooks, as does also the wasp.

One species of wasp in England (*Vespa holsatica*) builds a pendent oval vespiary with a smooth outside, attached to the branches of a shrub or tree; the aperture is at the pendent apex. We once saw the nest of a species of wasp, perhaps the *Vespa Britannica*, built in a gooseberry-bush in a garden a little distance from Buxton in Derbyshire; it was pendent, and loosely constructed externally of foliaceous layers. The entreaties of some females in the party prevented our securing it.

There is also a British species (*Odynerus Parietum*) which builds a group of eighteen or twenty crucible-like cells, attaching them to palings or other woodwork, without any case or covering. Among the most interesting nests of wasps which we have seen and examined is one of a species in South America: it is pensile, and suspended from the branch of a tree; its shape is like two cones base to base, but of different lengths, the shorter cone pointing downwards. Its external wall is composed of stout, tough, white cardboard, which takes ink from a pen extremely well; it is smooth and fine-grained. The aperture for admission is at the lower apex; the length of the nest is nine inches; the circumference at the widest part, where the two cones meet, about eighteen inches. Internally six stout layers or floors stretch horizontally across, smooth above, with hexagonal cells below. These platforms are not, however, flat, but concave above, like a watch-glass reversed. The centre of each is perforated for admission at the extremity of a short funnel-like projection; and by this aperture access is gained from story to story. The whole in fact is a masterpiece of workmanship, and an exquisite display of the results of instinct.

We have stated that the wasp is not a collector of nectar and a storer of honey. This assertion does not apply to certain foreign species. In the 'Magazine of Natural History,' 1841, the nest of a honey-wasp is described and figured. The species is new, and from South America. Its describer, Mr. White, has given it the scientific title of *Myrapetra scutellaris*, and observes that it is the same as that of which Azara gives many interesting details, under the name of the 'Chiguana Wasp.' The general form of this nest, which is suspended to a slender branch, is ovate; its external wall consists of stout cardboard thickly covered with conical knobs of various shapes, which are firm and solid. Its inner structure bears great resemblance to that of the last described, but the doors of access from story to story are at the sides of each platform. The external entrances are protected by knotted pent-roofs, as a security against rain. The combs or platforms are fourteen in number, and many of the cells were found to contain honey, but time had rendered it nearly tasteless (p. 315, *et seq.*). Besides this species, several other South American wasps also store honey, as was observed by Azara, and also by M. Auguste de St.-Hilaire. The latter naturalist found, as he states, near the river Uruguay, an oval grey-coloured nest of a papery consistence, like that of the European wasps, suspended from the branches of a small shrub about a foot from the ground. He and two attendants partook of the honey, which was of very superior flavour, but which produced poisonous effects both on himself and his attendants. The insect he named *Polistes Lecheguana*. (See 'Ann. des Sc.,' 1824, vol. iv., p. 335; and also Mr. White's Paper above referred to.) We may observe that the honey of bees, where poisonous plants abound, has been known to produce deleterious effects; but whether the wasp's honey in question was noxious merely by accident, or whether such is always its nature, does not appear to be ascertained.

[St. Christopher.]

ESSAYS ON THE LIVES OF REMARKABLE PAINTERS.—No. XVIII.

Andrea Mantegna (*continued*)—The Invention of Engraving in Wood and Copper: 1423-1452.

Andrea Mantegna was not only eminent as a painter; he owed much of his celebrity and his influence over the artists of that age to the multiplication and diffusion of his designs by copper-plate engraving, an art unknown till his time: he was one of the first who practised it; certainly the first painter who engraved his own designs.

In these days, when we cannot walk through the streets even of a third-rate town without passing shops with their windows filled with engravings and prints, when not our books only but the newspapers that lie on our tables are illustrated; when the 'Penny Magazine' can place a little print after Mantegna at once before the eyes of fifty thousand readers; when every beautiful work of art as it appears is multiplied and diffused by hundreds and thousands of copies—we find it difficult to throw our imagination back to a time when such things were not.

What printing did for literature, engraving on wood and copper has done for painting—not only diffused the designs and inventions of artists, which would otherwise be confined to one locality, but in many cases preserved those which would otherwise have perished altogether. It is interesting to remember that three inventions to which we owe such infinite intruction and delight were almost simultaneous. The earliest known impression of an engraving on wood is dated 1423; the earliest impression from an engraved metal plate was made about 1452; and the first printed book, properly so called, bears date according to the best authorities, 1455.

Stamps for impressing signatures and characters on paper, in which the required forms were cut upon blocks of wood, we find in use in the earliest times. Seals for convents and societies, in which the distinctive devices or letters were cut hollow upon wood or metal, were known in the fourteenth century. The transition seems easy to the next application of the art, therefore it is, perhaps, that the name of the man who made this step is lost. All that is certainly known is, that the first wood-blocks for the purpose of pictorial representations were cut in Germany, in the province of Suabia; that the first use made of the art was for the multiplication of playing-cards, which about the year 1418 or 1420 were manufactured in great quantities at Augsburg, Nuremberg, and Venice; and that the next application of the art was devotional,—to multiply rude figures of saints, which were distributed among the common people. The earliest wood-cut known is a coarse figure of St. Christopher, dated 1423. This curiosity exists in the library of Earl Spencer at Althorpe.* Another impression, which is declared by connoisseurs to be a little later, is in the Royal Library at Paris, where it is framed and hung up for the inspection of the curious. Rude, ill-drawn, grotesque—printed with some brown-

* A reduced imitation of this earliest known wood-cut is given above, for which we are indebted to Mr. Jackson, who engraved it for his 'Treatise on Wood-Engraving.'

ish fluid on the coarsest ill-coloured paper—still it is impossible to look at it without some of the curiosity, interest, and reverence with which we regard the first printed book, which, however, in comparison with this first sorry specimen of a wood-cut, was a beautiful performance.

Up to a late period, the origin of engraving on copper was involved in a like obscurity, and volumes of controversy have been written on the subject; some claiming the invention for Germany, others for Italy: at length, however, the indefatigable researches of antiquarians and connoisseurs, aided by the accidental discovery in 1794 of the first impression from a metal plate, have set the matter at rest. If to Germany belongs the invention of engraving on wood, the art of copper-plate engraving was beyond all doubt first introduced and practised at Florence; yet here again the invention seems to have arisen out of a combination of accidental circumstances rather than to belong of right to one man. The circumstances, as well as we can trace them, were these:

The goldsmiths of Italy, and particularly of Florence, were famous, in the fifteenth century, for working in *Niello*. They traced with a sharp point or graver on metal plates, generally of silver, all kinds of designs, sometimes only arabesques, sometimes single figures, sometimes elaborate and complicated designs from sacred and profane history. The lines thus cut or *scratched* were filled up with a black mass of sulphate of silver, so that the design traced appeared very distinct contrasted with the white metal: in Italy the substance used in filling up the lines was called from its black colour, in Latin *nigellum*, and in Italian *niello*. In this manner church plate, as chalices, and reliquaries; also dagger-sheaths, sword-hilts, claspe, buttons, and many other small silver articles, were ornamented. In Sir John Soane's Museum there is an old MS. book, of which the binding exhibits some beautiful specimens of niello-work of the fifteenth century those who practised the art were called *niellatori*.

According to Vasari's account, Maso Finiguerra was a skilful goldsmith, living in Florence; he became celebrated for the artistic beauty of his designs and workmanship in niello. Finiguerra is said to be the first to whom it accidentally occurred to try the effect of his work, and preserve a memorandum of his design in the following manner:—Previous to filling up the engraved lines with the *niello*, which was a final process, he applied to them a black fluid easily removed, and then laying a piece of damp paper on the plate or object, and pressing or rubbing it forcibly, the paper imbibed the fluid from the tracing, and presented a fac-simile of the design, which had the appearance of being drawn with a pen. That Finiguerra was the first or the only worker in *niello* who used this method of trying the effect of the work is more than doubtful; but it is

[The Pax of Maso Finiguerra.]

certain that the earliest known impression of a niello plate is the impression from a pax* now existing in the church of S. Giovanni at Florence, executed by Finiguerra, and representing the subject we have often alluded to—the Coronation of the Virgin by her Son the Redeemer, in presence of Saints and Angels; it contains nearly thirty minute figures most exquisitely designed. This relic is preserved in the royal library at Paris, where it was discovered lying among some old Italian engravings by the Abbé Zani. The date of the work is fixed beyond all dispute; for the record of the payment of sixty-six gold ducats (32*l.* sterling) to Maso Finiguerra for this identical pax still exists, dated 1452. The only existing impression from it must have been made previously, perhaps a few weeks or months before. It is now, like the first wood-cut, framed and hung up for the inspection of the curious, and we have given a copy in the preceding page.

Another method of trying the effect of niello-work before it was quite completed, was by taking the impression of the design, not on paper, but on sulphur, of which some curious and valuable specimens remain. After seeing several impressions of niello plates of the fifteenth century, we are no longer surprised to find skilful goldsmiths converted into excellent painters and sculptors. In our own time this art, after having been forgotten since the sixteenth century, when it fell into disuse, has been very successfully revived by Mr. Wagner, a goldsmith of Berlin, now residing at Paris.

We have no evidence that it occurred to Maso Finiguerra, or any other niello-worker, to engrave designs on plates of copper for the express purpose of making and multiplying impressions of them on paper. The first who did this as a trade or profession was Baccio Baldini, who, about 1467, employed several painters, particularly Sandro Botticelli (of whom we have spoken already) and Filippino Lippi, to make designs for him to engrave. Andrea Mantegna caught up the idea with a kind of enthusiasm: he made the first experiment when about sixty, and, according to Lanzi, he engraved, during the sixteen remaining years of his life, not less than fifty plates: of these about thirty are now known to collectors, and considered genuine.

Familiar as we now are with all kinds of copper-plate and wood-engraving, there are persons who do not understand clearly the difference between them. Independent of the difference of the material on which they are executed, the grand distinction between the two arts is this,—that the engraver on copper cuts out the lines by which the impression is produced, which are thus left hollow, and afterwards filled up with ink; the impression is produced by laying a piece of wet paper on the plate, and passing them under a heavy and perfectly even roller. The method of the engraver on wood is precisely the reverse. He cuts away all the surrounding surface of the block of wood, and leaves the lines which are to produce the impression prominent; they are afterwards blackened with ink like a stamp, and the impression taken with a common printing-press.

When Andrea Mantegna made his first essays in engraving on copper, he does not seem to have used a press or roller; perhaps he was unacquainted with that implement. At all events the early impressions of his plates have evidently been taken by merely laying the paper on the copper-plate, and then rubbing it over with the hand; and they are very faint and spiritless compared with the later impressions taken with a press.

* A pax or pix is the name given to the vessel in which the consecrated bread or wafer of the sacrament was deposited. This vessel was usually of the richest workmanship, often enriched with gems.

USES OF THE WALNUT-TREE.

The walnut-tree is one of a kind not very extensive in this country, viz., those of which both the timber and the fruit are largely available. The majority of our timber-trees do not yield fruit eaten by man; while the majority of our fruits are obtained from plants not yielding available timber. The walnut-tree affords, in its timber, its fruit, its sap, its roots, and its bark, many useful products, which sufficiently demand our attention; though writers of former time seem to have attributed to this tree virtues more in number than are at present recognised in it. Cowley, in one of his poems, draws a fanciful analogy between the walnut-fruit and the brain, both in shape, in "seam-joined shell," in membrane within the shell, in pericardium without the shell, and in hairy filaments exterior to all. He then enumerates a few of its excellencies:—

> "Her timber is for various uses good:
> The carver she supplies with useful wood;
> She makes the painter's fading colours last;
> A table she affords us, and repast;
> E'en while we feast, her oil our lamp supplies;
> The rankest poison by her virtues dies,
> The mad dog's foam, and taint of raging skies.
> The Pontic king, who lived where poisons grew,
> Skilful in antidotes, her virtues knew."

Lastly, he bemoans the unfair usage which the tree receives:—

> "Yet envious fates, that still with merit strive,
> And man, ungrateful, from the orchard drive
> This sovereign plant; excluded from the field,
> Unless some useless nook a station yield,
> Defenceless in the common road she stands,
> Exposed to restless war of vulgar hands."

The walnut forms a lofty tree with spreading branches, with a thick and deeply-furrowed bark. It was originally brought from Persia, and was found by Pallas in the Russian provinces of the Caspian. At what period it was introduced into Europe is not known; but it was cultivated by the Romans before the death of the emperor Tiberius, and is supposed to have been brought from Greece by Vitellius. Ovid alludes to the custom of the nuts being knocked off the trees by boys, and to another custom of the bride and bridegroom at a wedding throwing walnuts among the boys who surrounded them. The walnut-tree became by degrees planted in almost every country in Europe, and was particularly valued in France for its fruit, oil, and wood. Thus Evelyn says:—"Burgundy abounds in walnut-trees, where they stand in the midst of goodly wheat-lands, at sixty and a hundred feet distance; and so far are they from hurting the crop, that they are looked upon as great preservers, by keeping the ground warm; nor do the roots hinder the plough. Whenever they fell a tree, which is only the old and decayed, they also plant a young one near him; and, in several places, betwixt Hanau and Frankfort, in Germany, no young farmer whatsoever is permitted to marry a wife till he bring proof that he is father of such a stated number of walnut-trees; and the law is inviolably observed to this day, for the extraordinary benefit which this tree affords to the inhabitants." The marriageability of a farmer does not probably now depend on the possession of walnut-trees; but the prevalence of the custom in Evelyn's time singularly illustrates the value placed upon the tree.

The wood of the walnut is white in young trees, but as the tree grows older, the wood becomes solid, compact, easy to work, veined, and having a brown

colour shaded with light brown and black. Mr. Selby says that previous to the introduction of the mahogany and other beautiful exotic woods, that of the walnut was held in higher estimation than any other European tree, and supplied their place in the manufacture of the most valuable and costly pieces of furniture, examples of which are still occasionally to be seen in houses of ancient date, whose beauty in grain, polish, and pattern would bear comparison with the elegant woods of the present day.

Among the uses enumerated by Mr. Loudon to which walnut-wood is applied, are screws for presses, sabots, clogs, musical instruments, gun-stocks, and other articles made by turners, cabinet-makers, joiners, coachmakers, and millwrights. Its use for gun-stocks has led to singular results, both commercial and agricultural. On different occasions, when the supply of wood has been scarce, the gun-stock makers have given very high prices for it. In the winter of 1709 a large number of walnut-trees were killed in Switzerland, France, and Germany; and the Dutch, foreseeing therefrom the probable scarcity of walnut-wood, bought up all the trees they could procure, and sold them again in subsequent years at very advanced prices. In 1720 an Act was passed in France to prevent the exportation of walnut-timber, on pain of confiscation, and payment of a fine of three thousand livres. During the wars of France the number of gun-stocks made was so large in that country, that twelve thousand walnut-trees were required in the year 1806 for this purpose; and hence many persons were led to plant such trees on speculation. In England, also, the value of walnut-wood became so high, that as much as 600*l.* was given for a single tree. This led to the importation of the black walnut from America, by which the exorbitant value of the common walnut was effectually lessened. In consequence of the substitution of mahogany and other tropical woods for articles of furniture, and of gun-stock wood from the Black Sea and North America, the cultivation of the walnut as a timber-tree has declined in this country. Evelyn devotes much attention to the timber of this tree. He recommends its use for household furniture, utensils, and wainscoting; and he says that the joiners of Grenoble, in order to give a better colour to the wood, "put the boards into an oven after the batch is forth, or lay them in a warm stable; and, when they work it, polish it over with its own oil, very hot, which makes it look black and sleek; and the older it is, the more estimable; but then it should not be put in work till thoroughly seasoned, because it will shrink beyond expectation."

The fruit of the walnut has long been celebrated. It is of a roundish oval form, green externally, with a nut occupying about two-thirds of the bulk. Towards autumn the green husk softens, and by its decay allows the nut to fall out. In the young and green state the fruit is pickled; while in a more mature state the enclosed nut is eaten—as a luxury in some countries, and as an article of food in others. In some parts of Italy, France, and Switzerland, when the fruit is nearly ripe, a traveller may walk for many miles under a continous grove of walnut-trees, with the fruit hanging over his head; and Mr. Loudon says that he has known the case of a person who travelled by a public conveyance from Florence to Geneva, eating scarcely anything by the way except walnuts and heads of maize, which he gathered by the road-side. The fruit, both in France and England, is commonly knocked down from the tree by threshing the extremity of the branches with long poles; or, which is deemed a better plan, by shaking the branch without beating it. In gathering up the fruit, those nuts which have separated from the husks are kept by themselves, taken home, and spread in a layer on the boarded floor of an airy room, where they are turned over daily till dried. Those fruits from which the husks are not separated in falling, are placed in heaps by themselves, and are turned and gently beaten till the husks separate. When the nuts have been thus separated from the husk, they are either used to obtain walnut-oil, or are eaten in the raw state, or are otherwise prepared as an article of food. About the end of September or the beginning of October the nuts are in the fit state to be eaten raw; and they may be preserved for many months by burying them in dry soil or in sand, so deep as to be out of the reach of frost, sun, and rain; or else by placing them in dry cellars, and covering them with straw.

The French prepare a dish consisting of the green kernel of the nut, scooped out from the shell about a fortnight before being ripe, and eaten with salt, vinegar, pepper, and shallots. It is at a somewhat earlier period, viz., about the month of June, that the walnuts are in a fit state for preserving; they are preserved either with or without the husks, the former being deemed more wholesome, but the latter more agreeable. About the same time, too, they are in a fit state for pickling. Of the dried kernels, a *conserve brûlée* is made in France, which is much relished. In Spain the gratings of old and hard walnuts are strewed over tarts and sweetmeats.

The use of the walnut for procuring oil is more extensive and important than its use in food. When the fruit is gathered and the nuts separated from the husks, they are kept dry till the close of winter, at which time the mucilage of the fruit has become converted into oil. The nut is cracked with a small mallet, without injuring the kernel; and the sound kernels, cleared from every particle of shell, are crushed by a millstone worked either by horse-power or water-power. The resulting paste, being enclosed in strong linen bags, is next pressed, by which oil is forced out of it. The oil which flows from the first pressure is of the best quality; it is very clear, and proper for food; but it sensibly retains the taste of the nut, which to some persons is disagreeable. In order to keep it sweet for the table, it is drawn off several times during the first few months, carefully corked, and deposited in a cool cellar. After the first expression of oil, the paste is emptied from the bags, moistened with warm water, and moderately heated in coppers; after which it is replaced in the bags, and pressed a second time, by which oil is procured more highly coloured and more likely to become rancid than the oil first obtained.

Mr. Bakewell, in his 'Travels in the Tarentaise, gives a very interesting description of the mode of conducting these processes in Piedmont. He says that after the walnuts have been gathered, the husks removed, and the nut dried, preparations commence for taking out the kernels. "Several of the neighbouring peasants, with their wives and elder children, assembled at the château of an evening, after their work was done. The party generally consisted of about thirty persons, who were placed around a long table in the kitchen; one man sat at each end of the table, with a small mallet to crack the nuts by hitting them on the point. As fast as they are cracked, they are distributed to the other persons around the table, who take the kernels out of the shell, and remove the inner part; but they are not peeled. The peasants of Savoy are naturally lively and loquacious, and they enliven their labours with facetious stories, jokes, and noisy mirth. About ten o'clock the table is cleared to make room for the *goûté* or supper, consisting of dried fruit, vegetables, and wine; and the remainder of the evening is spent in singing and dancing, which is sometimes continued till midnight." The crushing

and pressing of the kernels take place when the whole harvest of nuts is ready.

The walnut-oil thus obtained is largely used in France as a substitute for olive-oil at the table, for almond-oil in medicine, and for whale-oil in illumination. It is also much used in the arts. Artists employ it in the preparation of white and delicate colours, for which it is preferred in France to other oils, on account of the complete and rapid manner in which it dries, and the facility with which it is obtained in a perfectly limpid state. In France, too, walnut-oil is much used in copper-plate printing, modified according to the colour of the ink, in which it is a component ingredient. It is boiled down in an iron or copper vessel, till reduced to a certain thickness, depending on the lightness or darkness of the tints to be produced. It is said that the backs of prints printed with ink containing walnut-oil do not turn yellow so soon as when other oils are employed. When all the oil has been expressed from the kernel, the remaining 'marc,' or solid matter, is used to fatten swine and sheep, or is made into cakes for fattening poultry, or (in some districts) is made into candles, which burn with a bright and clear flame.

The husk of the nut is by no means useless, for it produces a brownish dye, as may be seen from the state of the hands in those persons who handle the green fruit. A dye is obtained from the husks thus:—When removed from the kernels, they are moistened and left to rot in a heap; after which they are boiled in a considerable quantity of water. This liquor will impart a beautiful dye to wood, darker or lighter in tint according to the proportion between the husks and the water. Sometimes the flooring of rooms is dyed by boiling the husks to a kind of paste, strewing this in a layer over the floor, and allowing it to remain till dry, by which time the wood will have imbibed the dye.

The other parts of the walnut-tree yield a few useful products. In Tartary, an incision is made in the tree in spring, when the sap is rising, and a spigot is inserted for some time; after which, on withdrawing the spigot, a clear sweet liquor flows out, which, when coagulated by evaporation, is used as sugar. In other parts of Europe and Asia, a wine is made from the sap, or a spirit distilled from it. The roots of the walnut-tree, before the rising of the sap, yield, by boiling, a dark brown dye, which may be readily applied to wood, hair, or wool; it is used by gipsies, and also by theatrical performers, to stain the skin of a deep brown. The leaves and the bark of the young shoots may also be made to yield a similar dye, by procuring the bark when the sap is in movement in spring, and by gathering the leaves when the nuts are half formed.

For fuel the wood of the walnut-tree, when dry, is considered about equal to that of the common sycamore, burning with a mild flame. As charcoal, it is not very productive. A full-sized tree, it has been stated, will yield, from burning its leaves, a quantity of potash equal to one-third the weight of the leaves themselves.

In medicine the walnut-tree is not without its uses. Gerard said that "the green and tender nuts, boyled in sugar, and eaten as suckarde, are a most pleasant and delectable meate, comfort the stomache, and expell poyson." A fine stomachic liquor is made from the young nuts about the middle of June. Pliny said that walnuts, "eaten after onions, prevent them from rising." The bark, either in a green or a dried state, and an extract obtained from the nuts, are powerfully emetic; the root is purgative and diuretic; a decoction of the wood is sudorific; the sap of the leaves is used as a horse-medicine; the vinegar in which walnuts have been pickled is used as a gargle; and various other medicinal agents are procured from different parts of the tree, adding to the number of services which it renders to man.

Mexico described by Cortes.—This city has many public squares, in which are situated the markets and other places for buying and selling. There is one square twice as large as that of the city of Salamanca, surrounded by porticos, where are daily assembled more than sixty thousand souls engaged in buying and selling; and where are found all kinds of merchandise that the world affords, embracing the necessaries of life, as for instance articles of food, as well as jewels of gold and silver, lead, brass, copper, tin, precious stones, bones, shells, snails, and feathers. There are also exposed for sale wrought and unwrought stone, bricks burt and unburt, timber hewn and unhewn, of different sorts. There is a street for game, where every variety of birds found in the country are sold, as fowls, partridges, quails, wild-ducks, fly-catchers, widgeons, turtle-doves, pigeons, reed-birds, parrots, sparrows, eagles, hawks, owls, and kestrels; they sell likewise the skins of some birds of prey, with their feathers, head, beak, and claws. There are also sold rabbits, hares, deer, and little dogs, which are raised for eating, and castrated. There is also an herb street, where may be obtained all sorts of roots and medicinal herbs that the country affords. There are apothecaries' shops, where prepared medicines, liquids, ointments, and plasters are sold; barbers' shops, where they wash and shave the head; and restaurateurs, that furnish food and drink at a certain price. There is also a class of men like those called in Castile porters, for carrying burdens. Wood and coals are seen in abundance, and braziers of earthenware for burning coals: mats of various kinds for beds, others of a lighter sort for seats, and for halls and bedrooms. There are all kinds of green vegetables, especially onions, leeks, garlic, water-cresses, nasturtium, borage, sorel, artichokes, and golden-thistles; fruits also of numerous descriptions, among which are cherries and plums, similar to those in Spain; honey and wax from bees, and from the stalks of maize, which are as sweet as the sugar-cane; honey is also extracted from the plant called maguey, which is superior to sweet or new wine; from the same plant they extract sugar and wine, which they also sell. Different kinds of cotton threads of all colours in skeins are exposed for sale in one quarter of the market, which has the appearance of the silk-market at Granada, although the former is supplied more abundantly. Painters' colours, as numerous as can be found in Spain, and as fine shades; deer-skins dressed, and undressed, dyed different colours; earthenware of a large size and excellent quality; large and small jars, jugs, pots, bricks, and an endless variety of vessels, all made of fine clay, and all or most of them glazed and painted; maize, or Indian corn, in the grain and in the form of bread, preferred in the grain for its flavour to that of the other islands and terra-firma; patés of birds and fishes; great quantities of fish, fresh, salt, cooked, and uncooked; the eggs of hens, geese, and of all the other birds I have mentioned, in great abundance, and cakes made of eggs. Finally, every thing that can be found throughout the whole country is sold in the markets, comprising articles so numerous, that to avoid prolixity, and because their names are not retained in my memory or are unknown to me, I shall not attempt to enumerate them. Every kind of merchandise is sold in a particular street or quarter assigned to it exclusively, and thus the best order is preserved. They sell every thing by number or measure; at least so far we have not observed them to sell any thing by weight. There is a building in the great square that is used as an audience-house, where ten or twelve persons, who are magistrates, sit and decide all controversies that arise in the market, and order delinquents to be punished. In the same square there are other persons who go constantly about among the people observing what is sold, and the measures used in selling; and they have been seen to break measures that were not true.—*Despatches of Hernando Cortes, translated by G. Folsom.*

The Basilisk, among the ancients, was a famous kind of serpent, called a cockatrice, said to be produced from a cock's egg hatched by a serpent, and supposed to kill by its breath or sight only. The constructors of this marvel forgot to say how any one lived to tell the story. The basilisk of the moderns is merely a long-tailed lizard, living in freshwater ponds and rivers of the East India islands, and feeding on vegetables.